Supplemental Materials for "Dimensionality and the Number of Parties in Legislative Elections"

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This paper contains supplemental materials for "Dimensionality and the Number of Parties in Legislative Elections".

1 Models

1.1 Models Presented in the Main Paper

In Tables 1–4, we present key excerpts from the variance–covariance matrices of the coefficients for the original Models 3, 4, 5 and 6, all rounded to two significant digits. These matrices will allow interested readers to approximately replicate the calculation of the confidence intervals for the marginal effects of dimensionality that were presented in the main paper's Table 3. The complete variance–covariance matrices are available in electronic format from the author. Note that the robust Newey-West standard errors are calculated in STATA 7.0 using the time series cross-section extension to the "newey" command developed by Roodman (2002).

1.2 Additional Models

We next present models discussed but not presented in the main paper.

1.2.1 Alternate Cases

First, we eliminate some potentially problematic countries from the analysis. Tables 5, 7, and 9 display the estimated coefficients and standard errors for the original Models 1–6 when Belgium, Italian, and Japanese elections are eliminated, respectively. Note that Japanese elections only need to be eliminated for Models 1 and 3 because neither Nyblade's (2004) measures nor data on new parties is available for Japan. Relatedly, Tables 6, 8, and 10 display the corresponding estimated marginal effects of dimensionality for both permissive (non-majoritarian) and restrictive (majoritarian) electoral systems, as well as ninety-five percent confidence intervals for the effects. One will quickly note the similarity of the estimated

coefficients and standard errors from these models to the originals, as well as the similarity of the estimated marginal effects. The only difference is that with Belgian elections eliminated, the coefficient on the raw issue dimensionality from Model 2 narrowly falls short of attaining conventional levels of significance, which may be partially explained by the reduction in the sample size.

Second, we include the United States in Model 5. We eliminated this country's elections from the original models because its number of new parties is calculated from presidential elections, whereas the calculation is based upon legislative elections for all other countries. The estimated coefficients and standard errors are shown in Table 11 and the estimated marginal effects in Table 12. While the estimated marginal effect of the number of new parties for restrictive electoral systems has changed sign and grown larger in substantive magnitude, our conclusions remain unchanged.

Third and finally, we estimate versions of Models 1, 3, and 5 on the more restricted set of cases used to estimate Models 2, 4, and 6, respectively. This is the set of cases for which Nyblade's (2004) measure of raw issue dimensionality is available, which does not include non-Western European countries. Doing this enables us to disentangle any differences in results due to our use of different measures of raw dimensionality from any differences in results due to our use of different sets of cases. Table 13 shows the estimated coefficients and standard errors and Table 14 the estimated marginal effects. The similarity between the estimated coefficients from the two versions of Model 1, as well as the similarity of the estimated marginal effects from the two versions of Models 3 and 5, suggest that most of the differences in results can be attributed to the differences in the measures of raw dimensionality. However, the cases do matter to some extent: using the smaller set of cases does cause the interaction term between the raw dimensionality and the dummy variable for majoritarianism in Model 3 to lose significance; moreover, the estimated marginal effect of raw dimensionality is now larger in absolute value in restrictive than in permissive electoral systems in both Models 3 and 5. The latter findings, which are less supportive of H2 and H3, may be due to the absence of many of the countries with restrictive electoral systems such as the United States from Nyblade's data set. This suggests that we might obtain results even more commensurate with the hypotheses from Models 2, 4 and 6 if we were able to combine Nyblade's measure with our larger set of cases.

1.2.2 Alternate Measures

First, we use two alternate measures of the raw ideological dimensionality, one based upon and the other taken directly from Stoll (2004). The first does not introduce any country- or time-period specific modifications to the baseline associations between coding categories and conflicts that were presented in the main paper's Appendix 1, and which are reproduced here in Table 24 (see below). All else mirrors the main paper's measure. The second is Stoll's (2004) original, most preferred measure, although we note that she does not use the term "raw ideological dimensionality" to describe it. Where this measure differs from the main paper's measure is that it does not normalize each party's manifesto to the same length; instead, it effectively allows parties with longer manifestos to contribute more to

the calculation. We label the first of these alternative measures "association invariant" and the second "non-normalized". We reiterate that we believe the measure used in the main paper to be superior to these alternatives. Table 15 displays the estimated coefficients and standard errors for versions of Models 1, 3 and 5 when these alternate measures are used. As before, Table 16 displays the estimated marginal effects for both permissive and restrictive electoral systems for these models. There is one difference in the results worth noting. Using the association invariant measure, dimensionality is found to have a statistically significant negative effect on the effective number of electoral parties under restrictive electoral systems (Model 3). While this is prima facie less consistent with H3, the negative sign combined with its substantive magnitude being smaller than that of permissive electoral systems leave us comfortable with the conclusion reported in the main paper.

Second, we use the logged average lower tier district magnitude as a measure of electoral system restrictiveness instead of the dummy variable for majoritarian electoral systems. We take this data from Golder (2005). Table 17 displays the estimated coefficients and standard errors for versions of Models 3–6 estimated using this alternative measure, while the estimated marginal effects are displayed graphically in Figures 1–4. Although the interaction term between the raw ideological dimensionality and electoral system restrictiveness in this version of Model 3 is no longer significant, we otherwise obtain similar results: we see from Figure 1 that the marginal effect of the raw ideological dimensionality on the effective number of electoral parties is always positive but only statistically significant for more permissive electoral systems, i.e., for those with average district magnitudes of approximately at least three. Similarly, for this version of Model 5, we see from Figure 3 that the marginal effect of the number of new parties on the raw ideological dimensionality is always positive but never statistically significant. Hence, we draw similar conclusions about H2 and H3 when using this alternative measure of electoral system restrictiveness in combination with the raw ideological dimensionality. Our conclusions do change when we combine it with the raw issue dimensionality, however. Figure 2 shows that this version of Model 4 yields a positive and statistically significant marginal effect of raw issue dimensionality on the effective number of electoral parties only for the more restrictive electoral systems (specifically, for countries with average district magnitudes less than approximately seven), contradicting H3. Likewise, we see from Figure 4 that the marginal effect of the number of new parties on the raw dimensionality is always positive but only significant for restrictive electoral systems, contradicting H2.

1.2.3 Alternate Model Specifications

We first present country fixed effects versions of Models 1–6. For each of these models, F-tests support the inclusion of the $N - 1$ country dummies. Table 18 displays the estimated coefficients and standard errors, and Table 19 the estimated marginal effects. While the estimated fixed effects are not shown, they are available upon request. On the more supportive front, we see that the interaction term in the model with the effective number of electoral parties as the dependent variable and Nyblade's (2004) measure of raw issue dimensionality as the independent variable (Model 3) is now statistically significant. On the less supportive

front, the estimated marginal effect of the number of new parties is now surprisingly negative under permissive electoral systems when using the raw ideological dimensionality as the dependent variable (Model 5). Moreover, this same marginal effect estimated using Nyblade's measure of raw issue dimensionality (Model 6) is no longer statistically significant under permissive electoral systems but is significant under restrictive electoral systems. Although the latter results provide less support for H2, the other hypotheses remain supported.

Next, we use the number of new parties as the dependent variable instead of the independent variable in versions of Models 5 and 6. This is done for comparability with the other models, which have the effective number of electoral parties as their dependent variable. Because the number of new parties is a count variable, using ordinary least squares (OLS) to estimate the model risks biased coefficients as well as biased standard errors. We employ a negative binomial regression model because of overdispersion in the data (e.g., the mean number of new parties is 1.5, but the variance is 3.5). While heteroskedasticity is not a problem for Models 5 and 6 when using OLS, which suggests that it will not be a problem for the negative binomial regression versions of these models, autocorrelation is a problem. Accordingly, we report country clustered standard errors because the preferred Newey-West robust standard estimates are not available for negative binomial regression models in STATA 7. Table 20 displays the estimated coefficients and standard errors, while Table 21 displays the estimated marginal effects as well as the predicted factor change in the expected count of new parties for a one dimension increase in each measure of dimensionality. From these tables, we can see that the only difference of note is that the marginal effect for restrictive electoral systems is now significant when using Nyblade's measure of raw issue dimensionality, whereas it was not originally. Hence, the reported conclusion regarding H2 is weakened when using Nyblade's measure, but upheld when using our measure of raw ideological dimensionality.

Finally, we employ the increasingly popular country-clustered robust standard errors instead of Newey-West robust standard errors for the Models 1–6. Table 22 displays the estimated coefficients and standard errors, while Table 23 displays the estimated marginal effects for the interaction models. One difference that we see in Table 22 relative to the main paper's Table 2 is that the raw dimensionality fails to attain conventional levels of significance in Models 1 and 2, although its p-values are still respectable. (Using a one-sided test, they only narrowly fall short of attaining conventional levels of significance.) From Table 23, we see two differences: first, the marginal effect of raw dimensionality on the effective number of electoral parties using Nyblade's measure of raw issue dimensionality (Model 4) is no longer significant under permissive electoral systems and is now significant under restrictive electoral systems; second, the marginal effect of the number of new parties on the raw dimensionality using this same measure (Model 6) is now significant under restrictive electoral systems as well as under permissive ones, although we note that the magnitude of the effect is larger under permissive than restrictive systems. Combined, these findings offer less support for the hypotheses. However, the findings for the most important of the hypotheses, H2 and H3, are unchanged when using the preferred measure of raw dimensionality, our measure of raw ideological dimensionality.

2 More on Measuring Raw Ideological Dimensionality

We now turn to providing more information about the measure of raw ideological dimensionality introduced by the main paper, which is a slight modification of the measure we earlier introduced in Stoll (2004). As noted in the main paper, there are two key decisions upon which the measure rests: first, which ideological conflicts will be considered potentially salient, and second, which sets of issues (coding categories in the CMP data set) are related to which ideological conflicts. We focus on the second decision here, since we believe that the first is sufficiently addressed in the main paper. See Stoll (2004) for a more detailed discussion of all of these matters.

To begin, the associations between coding categories and cleavages are made on theoretical grounds *exogenous to the data*, with a few exceptions that are detailed below. That is, we do not use data-driven statistical techniques such as factor or principal components analysis to make associations. Our approach builds upon that suggested and partially taken by Budge, Klingemann, Volkens, Bara and Tanenbaum (2001). We take this approach for three reasons. First and foremost, data reduction techniques would produce a measure of the effective instead of the raw dimensionality. Second is the structure of the data. With salience coded across fifty-six coding categories and a small (usually less than ten) number of observations (parties) for each country–election, data-driven statistical techniques cannot be applied to produce a time-series cross-sectional measure: the number of variables greatly outstrips the number of observations in each country–election. Such techniques can, at best, average over time in a country, which obviously runs counter to our goal of a measure that varies across both space and time. Third, for whatever reason, as Warwick (2002) has noted, the correlations between coding categories in the CMP data set are quite low. Sets of issues that theory unambiguously tells us should go together often do not correlate highly, the consequence of which is that statistical techniques for data reduction do not yield parsimonious solutions. Consequently, we instead bring accumulated substantive knowledge to bear on the data in a pseudo-Bayesian fashion. Pertinent information that is not in the data—that categories relate—can be supplied by the analyst. Empirical support for some of the theoretically-driven associations is provided by past cross-national factor analyses, which have found, for example, that a reasonable number of the socioeconomic coding categories load onto a single dimension (e.g., Budge and Laver, 1992).

Table 24 reproduces in tabular format the baseline associations between the CMP coding categories and the seven potentially salient ideological conflicts that were originally described in Appendix 1 of the main paper. Most of these associations are uncontroversial. However, not all are. A brief discussion of the rationale underlying some of the less obvious, and hence more problematic, associations follows. 'Decentralization' (PER301) and 'Centralization' (PER302) are viewed as issues associated with the cultural–ethnic conflict because many such conflicts are characterized by geographically concentrated groups, who often seek greater political autonomy. 'National Way of Life: Negative' (PER602) and 'National Way of Life: Positive' (PER601) contain appeals to established national ideas, opposition to the existing national state, and expressions of nationalism in general, issues that also seem best related to the cultural–ethnic conflict. Particularly problematic categories are 'Social Jus-

tice', 'Multiculturalism: Positive', 'Multiculturalism: Negative', 'Underprivileged Minority Groups', and 'Non-Economic Demographic Groups'. The 'Social Justice' category relates primarily to equality in resources and opportunities but also includes racial discrimination. The former should be associated with the socioeconomic conflict and the latter with the cultural–ethnic conflict. Unfortunately, because we cannot parcel out the quasi-sentences related to racial discrimination without re-coding the manifestos, and because the plurality of these issues relate to socioeconomics, we associate this category with the socioeconomic conflict. This means that the salience of the cultural–ethnic cleavage may be underestimated and the salience of the socioeconomic cleavage overestimated. Similarly, the 'Multiculturalism', 'Non-economic Demographic Groups', and 'Underprivileged Minority Groups' categories mostly tap the cultural–ethnic conflict but to some extant also tap issues related to the religious conflict. As before, the categories have been associated with the conflict to which the plurality of issues relate, in this case culture–ethnicity, which means that the salience of the religious conflict may be underestimated and the salience of the cultural–ethnic conflict overestimated.

Ten coding categories are effectively left out of the baseline associations because we did not see how to unambiguously link them to a single ideological conflict. Many contain what might be viewed as classic valence issues. These even more problematic categories are: "Political Authority" (PER305); "Culture" (PER502); "Law and Order" (PER605); "Social Harmony" (PER606); "Constitutionalism: Positive" (PER203); "Constitutionalism: Negative" (PER204); "Government Efficiency" (PER303); "Corruption" (PER304); "Democracy" (PER202); and "Freedom and Human Rights" (PER201). The exception is for the countries that underwent a third wave transition to democracy: Greece, Portugal, and Spain. For these three countries, the "Freedom and Human Rights" and "Democracy" categories seem to obviously relate to and hence are associated with the democratic–authoritarian conflict over the nature of the political regime and the legacy of authoritarianism.

To deal with these difficult-to-associate categories, we introduce some country- and time-specific modifications to the baseline associations. These modifications are:

- The two "National Way of Life" categories may be more properly associated with the foreign policy than with the cultural–ethnic conflict for countries that have faced significant external threats, from border disputes to cold wars. Accordingly, we take whichever of the two associations seems the most reasonable for each country. For Greece (Turkey); Germany (Nazi legacy and the Cold War); Ireland (Northern Ireland); Israel (the Arab–Israeli and Israeli–Palestinian conflict) and the United States (the Cold War), this is deemed to be the foreign policy conflict. For France (de-colonization and the Cold War) and Austria (Cold War), this same association is made until the 1980s. For these two countries, because the issues in these categories are then taken up by the Freedom Movement and the Greens in Austria from 1981, and by the National Front amidst rising tensions regarding immigration in France from 1986, we associate these categories with the post-materialist and cultural–ethnic conflicts from 1981 and 1986 onwards, respectively.

- The "Culture" and "Law and Order" categories are associated with either the post-

materialist, the cultural–ethnic, or no conflict in a country depending upon the strength of their correlations with the baseline coding categories associated with these conflicts. For example, countries where "Culture" both reasonably correlates ($r > 0.30$) with one of the two post-materialist categories and is not more strongly correlated with the cultural–ethnic coding categories are Greece and the United Kingdom; for these two countries, "Culture" is consequently associated with the post-materialist conflict. Note that we begin the "Law and Order" association in 1960 because of its non-ideological prominence in the aftermath of World War II in several European countries.

- For Japan, the association of "Centralization" and "Decentralization" with the cultural–ethnic conflict is removed as these categories seem related to valence good governance concerns. By way of contrast, "Constitutionalism: Positive" and "Constitutionalism: Negative" likely reflect concerns over Japan's military role in the world and are consequently associated with the foreign policy conflict.

- For Israel, "Political Authority", "Democracy", and "Freedom and Human Rights" are best viewed as associated with the foreign policy conflict.

- For Canada, "Constitutionalism: Positive" and "Constitutionalism: Negative" reflect linguistic–ethnic tensions as the French-speaking minority has demanded alteration of the constitutionally-mandated federal–province relationship. Similarly, in Belgium, demands for greater autonomy for ethno-linguistic national minorities have been closely tied to revisions in the existing constitutional structure. These categories are consequently associated with the cultural–ethnic conflict for these two countries.

- In Austria, the call for a strong state has been a particular hallmark of the far right Freedom Movement; hence, the "Political Authority" category is associated with post-materialism.

Table 25 summarizes the modifications to the baseline associations. We reiterate that for the most part, theory has dictated the modifications. That is, the revised associations are again exogenous to the data with the few exceptions described above.

Moving away from the association between coding categories and conflicts, we note two important areas where our approach differs from that of others. First, Nyblade (2004) weights each party's contribution by its vote share, whereas we do not. In our procedure, each party contributes equally to the salience of each ideological conflict, and hence equally to the dimensionality. We explicitly strive to keep the ideological spaces of voters and parties separate: there are many reasons to believe that the two spaces may differ, as discussed in the main paper, and one of our goals is to see how the party-defined space relates to voter support for parties. Accordingly, building voter support into our measure of dimensionality would be counterproductive. Further, because only parties that are politically significant according Sartori's (1976) influential definition are included in the CMP, we do not worry about our procedure giving too much influence to marginal (i.e., insignificant) parties. In other words, because all of these parties have been judged to be politically significant, we

treat them all equally in estimating the party-defined ideological space. Second, as noted above, our procedure effectively normalizes all parties' manifestos to the same length, whereas the various measures constructed by Stoll (2004) do not.

Finally, we note in closing that the rationale underlying our use of the CMP data is straightforward: data simply does not exist to proceed in any other way. Two alternatives that come to mind are the analysis of either expert surveys; political elite surveys; or roll-call votes in legislatures. However, cross-national surveys of both experts and political elites currently neglect key conflicts such as ethnicity, so valid measures of dimensionality cannot be constructed using them. Moreover, such surveys exist for only a few time points, which obviously precludes the development of a time series cross-sectional measure. Similarly, roll-call data has not been compiled for a sufficiently large set of cases to allow for large-scale cross-national comparisons. At any rate, it is not clear what meaning such votes have, if they exist, in countries lacking the presidential, candidate-centered political system of the U.S. where roll-call analyses were pioneered. New projects that aim to analyze political (or legislative) speech (e.g., Monroe and Maeda, 2004) have great promise as an alternative source of data, but they are currently in their early stages.

References

Budge, Ian and Michael Laver. 1992. "Coalition Theory, Government Policy, and Party Policy." In Michael Laver and Ian Budge, eds., *Party Policy and Government Coalitions.* New York: St. Martin's.

Budge, Ian, Hans-Dieter Klingemann, Andrea Volkens, Judith Bara and Eric Tanenbaum, eds. 2001. *Mapping Policy Preferences: Estimates for Parties, Electors, and Governments 1945–1998.* New York: Oxford University Press.

Golder, Matt. 2005. "Democratic Electoral Systems Around the World, 1946–2000." *Electoral Studies* 24 (1): 103–21.

Lijphart, Arend. 1999. *Patterns of Democracy.* New Haven: Yale University Press.

Monroe, Burt L. and Ko Maeda. 2004. "Rhetorical Idea Point Estimation: Mapping Legislative Speech." Paper presented at the Society for Political Methodology Summer Meeting, Stanford University, Palo Alto, CA, 29–31 July.

Nyblade, Benjamin. 2004. "The 'Effective' Number of Issue Dimensions: A Measure with Application to West Europe." Paper presented at the Midwest Political Science Association National Conference, Chicago, IL.

Roodman, David. 2002. "NEWEY2: Stata module to extend newey (HAC covariance estimation)." Statistical Software Components S428901, Boston College Department of Economics. Revised 07 Feb 2004.

Sartori, Giovanni. 1976. *Parties and Party Systems: A Framework for Analysis.'* Vol. 1. Cambridge: Cambridge University Press.

Stoll, Heather. 2004. *Social Cleavages, Political Institutions, and Party Systems: Putting Preferences Back into the Fundamental Equation of Politics.* Ph.D. diss., Stanford University.

Warwick, Paul. 2002. "Towards a Common Dimensionality in West European Policy Spaces." *Party Politics* 8 (1): 101–22.

	Dimensionality	Majoritarian	Dim × Maj
Dimensionality	0.041		
Majoritarian	0.057	0.16	
Dim × Maj	−0.041	−0.11	0.080

Table 1: Key excerpts from the variance–covariance matrix of the coefficients for the main paper's Model 3. Variances and covariances rounded to two significant digits.

	Dimensionality	Majoritarian	Dim × Maj
Dimensionality	0.00055		
Majoritarian	0.0087	2.8	
Dim × Maj	−0.00055	−0.11	0.0049

Table 2: Key excerpts from the variance–covariance matrix of the coefficients for the main paper's Model 4. Variances and covariances rounded to two significant digits.

	New Parties	Majoritarian	Dim × Maj
New Parties	0.00016		
Majoritarian	0.00028	0.0038	
New Parties × Maj	−0.00016	−0.00058	0.00029

Table 3: Key excerpts from the variance–covariance matrix of the coefficients for the main paper's Model 5. Variances and covariances rounded to two significant digits.

	New Parties	Majoritarian	Dim × Maj
New Parties	0.028		
Majoritarian	0.045	1.4	
New Parties × Maj	−0.028	−0.20	0.071

Table 4: Key excerpts from the variance–covariance matrix of the coefficients for the main paper's Model 6. Variances and covariances rounded to two significant digits.

Model	1	2	3	4	5	6
Measure	Raw Ideology	Raw Issue	Raw Ideology	Raw Issue	Raw Ideology	Raw Issue
Intercept	3.2*** (0.29)	3.6*** (0.30)	2.8*** (0.26)	3.4*** (0.32)	1.4*** (0.34)	17*** (0.42)
Dimensionality	0.41** (0.21)	0.025 (0.017)	0.95*** (0.17)	0.039** (0.019)		
Majoritarian			0.59 (0.38)	−2.8* (1.7)	0.032 (0.060)	7.7*** (1.2)
Dimensionality × Majoritarian			−1.2*** (0.26)	0.087 (0.068)		
New Parties					0.0084 (0.011)	0.47*** (0.17)
New Parties × Majoritarian					−0.014 (0.016)	−0.14 (0.27)
n	330	220	330	220	205	159
Root MSE	1.2	1.1	1.0	1.1	0.33	3.9
R^2	0.018	0.011	0.27	0.048	0.0021	0.32

Table 5: The estimated OLS coefficients for Models 1–6 with Belgian elections eliminated. The dependent variable is the effective number of electoral parties for Models 1–4, and for Models 5 and 6, it is the raw dimensionality. Newey-West robust standard errors appear in parentheses. Significance codes are for two-sided tests, all calculated prior to rounding to two significant digits: 0.01, ***; 0.05, **; 0.10, *.

Model	Permissive	Restrictive
3	0.95	−0.25
	[0.61, 1.3]	[−0.64, 0.14]
4	0.038	0.13
	[0.0015, 0.076]	[−0.0039, 0.25]
5	0.0084	−0.0059
	[−0.013, 0.030]	[−0.028, 0.017]
6	0.47	0.33
	[0.12, 0.81]	[−0.083, 0.74]

Table 6: The estimated marginal effect for permissive (non-majoritarian) and restrictive (majoritarian) electoral systems with Belgian elections eliminated (Models 3–6). For Models 3 and 4, this is the marginal effect of raw dimensionality on the effective number of electoral parties; for Models 5 and 6, it is the marginal effect of the number of new parties on the raw dimensionality. Ninety-five percent two-sided confidence intervals appear in brackets.

Model	1	2	3	4	5	6
Measure	Raw Ideology	Raw Issue	Raw Ideology	Raw Issue	Raw Ideology	Raw Issue
Intercept	2.9*** (0.31)	3.3*** (0.32)	2.6*** (0.30)	3.0*** (0.38)	1.5*** (0.037)	17*** (0.44)
Dimensionality	0.63*** (0.22)	0.041** (0.019)	1.1*** (0.20)	0.066*** (0.024)		
Majoritarian			0.78* (0.41)	−2.4 (1.7)	−0.019 (0.062)	7.5*** (1.2)
Dimensionality × Majoritarian			−1.4*** (0.28)	0.059 (0.068)		
New Parties					0.011 (0.013)	0.42** (0.18)
New Parties × Majoritarian					−0.017 (0.017)	−0.097 (0.27)
n	334	224	334	224	208	162
Root MSE	1.3	1.3	1.2	1.3	0.35	4.1
R^2	0.035	0.023	0.26	0.065	0.0052	0.29

Table 7: The estimated OLS coefficients for Models 1–6 with Italian elections eliminated. The dependent variable is the effective number of electoral parties for Models 1–4, and for Models 5 and 6, it is the raw dimensionality. Newey-West robust standard errors appear in parentheses. Significance codes are for two-sided tests, all calculated prior to rounding to two significant digits: 0.01, ***; 0.05, **; 0.10, *.

Model	Permissive	Restrictive
3	1.1	−0.25
	[0.71, 1.5]	[−0.64, 0.14]
4	0.066	0.13
	[0.019, 0.11]	[−0.0039, 0.25]
5	0.011	−0.0059
	[−0.015, 0.036]	[−0.028, 0.017]
6	0.42	0.33
	[0.071, 0.78]	[−0.082, 0.74]

Table 8: The estimated marginal effect for permissive (non-majoritarian) and restrictive (majoritarian) electoral systems with Italian elections eliminated (Models 3–6). For Models 3 and 4, this is the marginal effect of raw dimensionality on the effective number of electoral parties; for Models 5 and 6, it is the marginal effect of the number of new parties on the raw dimensionality. Ninety-five percent two-sided confidence intervals appear in brackets.

Model	1	3
Measure	Raw Ideology	Raw Ideology
Intercept	2.9*** 2.6*** (0.31)	 (0.29)
Dimensionality	0.66*** (0.22)	1.2*** (0.20)
Majoritarian		0.76* (0.40)
Dimensionality × Majoritarian		−1.4*** (0.28)
n	334	334
Root MSE	1.4	1.2
R^2	0.038	0.27

Table 9: The estimated OLS coefficients for Models 1 and 3 with Japanese elections eliminated. The dependent variable is the effective number of electoral parties. Newey-West robust standard errors appear in parentheses. Significance codes are for two-sided tests, all calculated prior to rounding to two significant digits: 0.01, ***; 0.05, **; 0.10, *.

Model	Permissive	Restrictive
3	1.2 [0.75, 1.6]	−0.24 [−0.63, 0.15]

Table 10: The estimated marginal effect for permissive (non-majoritarian) and restrictive (majoritarian) electoral systems with Japanese elections eliminated (Model 3). This is the marginal effect of dimensionality on the effective number of electoral parties. Ninety-five percent two-sided confidence intervals appear in brackets.

Model	5
Measure	Raw Ideology
Intercept	1.5*** (0.036)
New Parties	0.0071 (0.013)
Majoritarian	0.021 (0.067)
New Parties × Majoritarian	0.036 (0.029)
n	227
Root MSE	0.37
R^2	0.030

Table 11: The estimated OLS coefficients for Model 5 with US elections included. The dependent variable is the raw dimensionality. Newey-West robust standard errors appear in parentheses. Significance codes are for two-sided tests, all calculated prior to rounding to two significant digits: 0.01, ***; 0.05, **; 0.10, *.

Model	Permissive	Restrictive
5	0.0071 [−0.018, 0.032]	0.043 [−0.0093, 0.095]

Table 12: The estimated marginal effect for permissive (non-majoritarian) and restrictive (majoritarian) electoral systems with US elections included (Model 5). This is the marginal effect of the number of new parties on the dimensionality. Ninety-five percent two-sided confidence intervals appear in brackets.

Model	1	3	5
Measure	Raw Ideology	Raw Ideology	Raw Ideology
Intercept	2.6*** (0.39)	2.6*** (0.40)	1.5*** (0.037)
Dimensionality	1.1*** (0.29)	1.1*** (0.29)	
Majoritarian		−1.1 (1.8)	0.16* (0.091)
Dimensionality × Majoritarian		0.31 (1.2)	
New Parties			0.0052 (0.013)
New Parties × Majoritarian			−0.026 (0.017)
n	237	237	171
Root MSE	1.3	1.3	0.35
R^2	0.071	0.088	0.014

Table 13: The estimated OLS coefficients for versions of Models 1, 3 and 5 estimated on the same set of cases as Models 2, 4 and 6, respectively. The dependent variable is the effective number of electoral parties for Models 1 and 3, and for Model 5, it is the raw dimensionality. Newey-West robust standard errors appear in parentheses. Significance codes are for two-sided tests, all calculated prior to rounding to two significant digits: 0.01, ***; 0.05, **; 0.10, *.

Model	Permissive	Restrictive
3	1.1	1.4
	[0.51, 1.7]	[−0.87, 3.7]
5	0.0052	−0.020
	[−0.020, 0.030]	[−0.044, 0.028]

Table 14: The estimated marginal effect for permissive (non-majoritarian) and restrictive (majoritarian) electoral systems for versions of Models 3 and 5 estimated on the same set of cases as Models 4 and 6, respectively. For Model 3, this is the marginal effect of raw dimensionality on the effective number of electoral parties; for Model 5, it is the marginal effect of the number of new parties on the raw dimensionality. Ninety-five percent two-sided confidence intervals appear in brackets.

Model	1	1	3	3	5	5
Measure	Raw Ideology (Association Invariant)	Raw Ideology (Non-Normalized)	Raw Ideology (Association Invariant)	Raw Ideology (Non-Normalized)	Raw Ideology (Association Invariant)	Raw Ideology (Non-Normalized)
Intercept	3.2*** (0.23)	2.8*** (0.31)	3.3*** (0.23)	2.4*** (0.31)	1.4*** (0.033)	1.5*** (0.038)
Dimensionality/New Parties	0.47*** (0.16)	0.76*** (0.23)	0.70*** (0.15)	1.3*** (0.22)	0.0041 (0.012)	0.0069 (0.013)
Majoritarian			0.28 (0.34)	0.82* (0.43)	−0.025 (0.055)	0.0029 (0.059)
Dimensionality/New Parties × Majoritarian			−1.1*** (0.23)	−1.4*** (0.31)	−0.011 (0.015)	−0.019 (0.017)
n	347	346	347	346	217	217
Root MSE	1.4	1.3	1.2	1.2	0.35	0.38
R^2	0.024	0.048	0.23	0.28	0.035	0.026

Table 15: The estimated OLS coefficients for Models 1, 3 and 5 when using two alternate measures of the raw ideological dimensionality. The dependent variable in Models 1 and 3 is the effective number of electoral parties and the dependent variable in Model 5 is the raw dimensionality; the independent variable in Models 1 and 3 is the raw dimensionality and the independent variable in Model 5 is the number of new parties. Newey-West robust standard errors appear in parentheses. Significance codes are for two-sided tests, all calculated prior to rounding to two significant digits: 0.01, ***; 0.05, **; 0.10, *.

Model	Permissive	Restrictive
3	0.70	−0.36
(Association Invariant)	[0.41, 0.99]	[−0.70, −0.028]
3	1.3	−0.16
(Non-Normalized)	[0.83, 1.7]	[−0.59, 0.29]
5	0.0041	−0.0069
(Association Invariant)	[−0.019, 0.027]	[−0.025, 0.012]
5	0.0069	−0.012
(Non-Normalized)	[−0.019, 0.033]	[−0.033, 0.0089]

Table 16: The estimated marginal effect for permissive (non-majoritarian) and restrictive (majoritarian) electoral systems using two alternate measures of the raw ideological dimensionality (Models 3 and 5). For Model 3, this is the marginal effect of dimensionality on the effective number of electoral parties; for Model 5, it is the marginal effect of the number of new parties on the dimensionality. Ninety-five percent two-sided confidence intervals appear in brackets.

Model	3	4	5	6
Measure	Raw Ideology	Raw Issue	Raw Ideology	Raw Issue
Intercept	2.8***	2.2***	1.4***	19***
	(0.37)	(0.52)	(0.044)	(1.0)
Dimensionality	0.35	0.077***		
	(0.27)	(0.027)		
Logged Magnitude	0.29**	0.54*	0.024	−0.13
	(0.15)	(0.31)	(0.024)	(0.13)
Dimensionality × Logged Magnitude	0.058	−0.014		
	(0.090)	(0.015)		
New Parties			0.0043	0.68***
			(0.012)	(0.26)
New Parties × Logged Magnitude			−0.021	−0.13
			(0.017)	(0.13)
n	347	237	217	171
Root MSE	1.2	1.3	0.35	4.5
R^2	0.20	0.084	0.0077	0.093

Table 17: The estimated OLS coefficients for versions of Models 3–6 that employ the logged average district magnitude as a measure of electoral system restrictiveness. The dependent variable in Models 3 and 4 is the effective number of electoral parties and the dependent variable in Models 5 and 6 is the raw dimensionality; the independent variable in Models 3 and 4 is the raw dimensionality and the independent variable in Models 5 and 6 is the number of new parties. Newey-West robust standard errors appear in parentheses. The estimated fixed effects are not shown. Significance codes are for two-sided tests, all calculated prior to rounding to two significant digits: 0.01, ***; 0.05, **; 0.10, *.

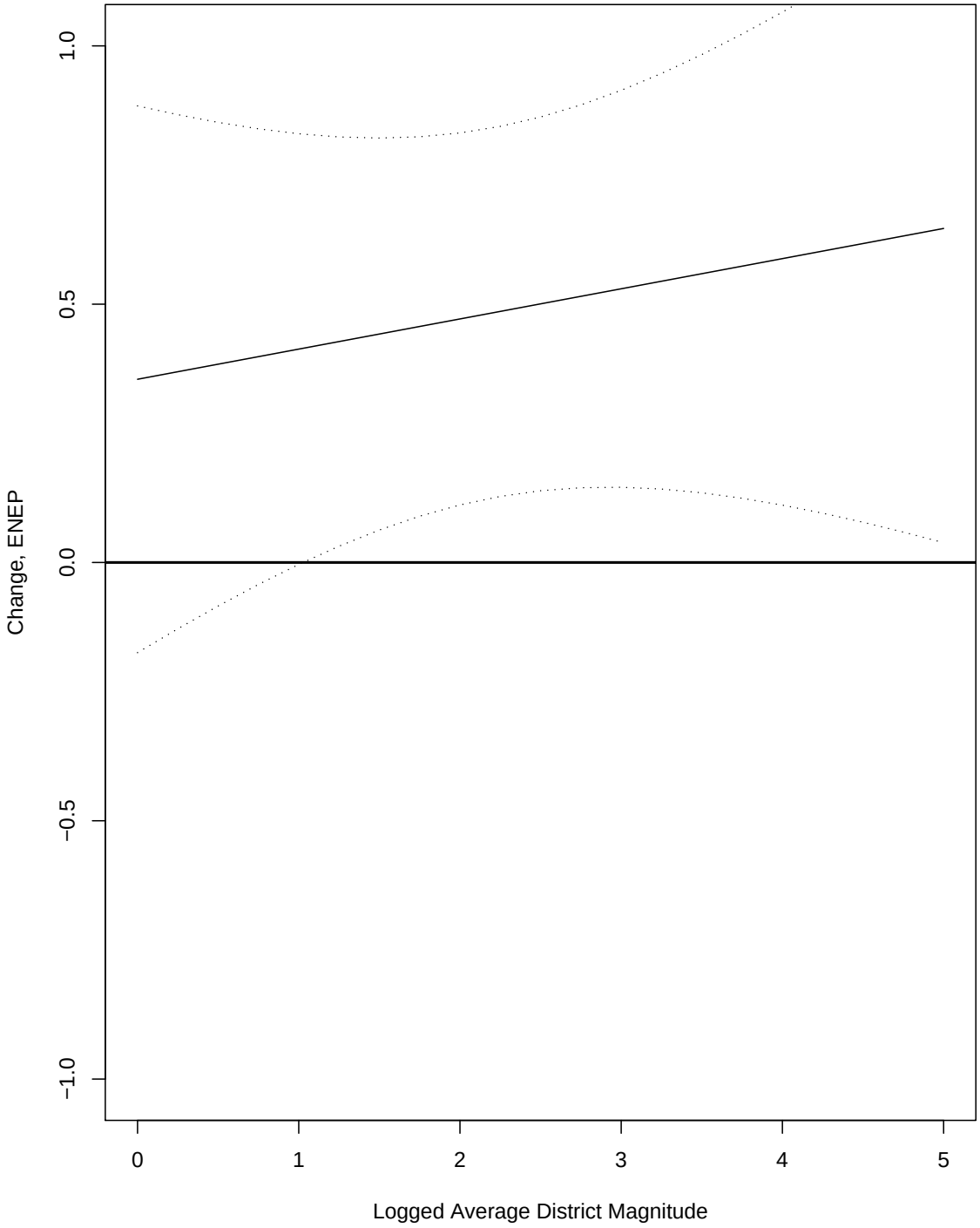

Figure 1: The estimated marginal effect of the raw ideological dimensionality upon the effective number of electoral parties for the observed range of the logged average district magnitude (Model 3).

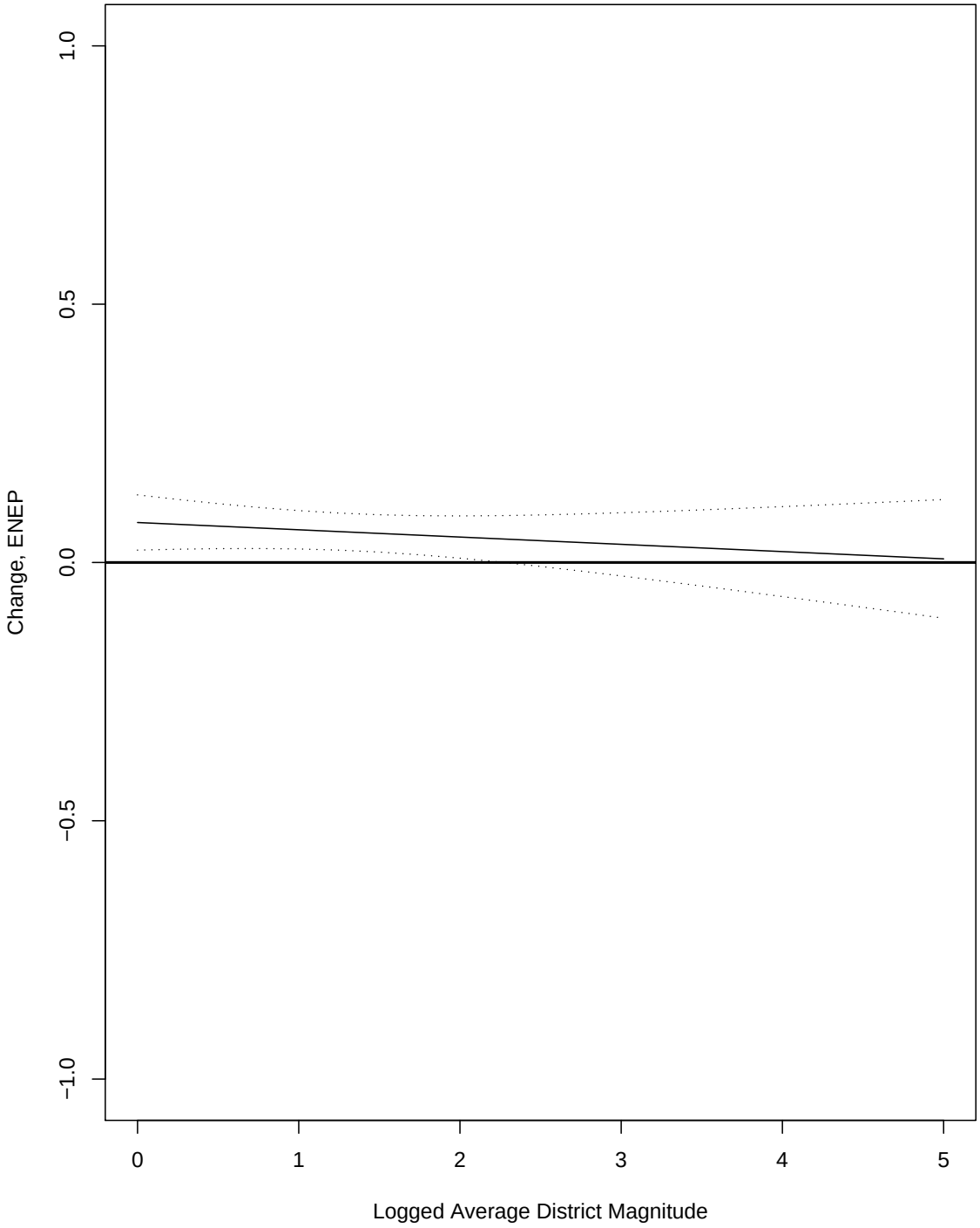

Figure 2: The estimated marginal effect of the raw issue dimensionality upon the effective number of electoral parties for the observed range of the logged average district magnitude (Model 4).

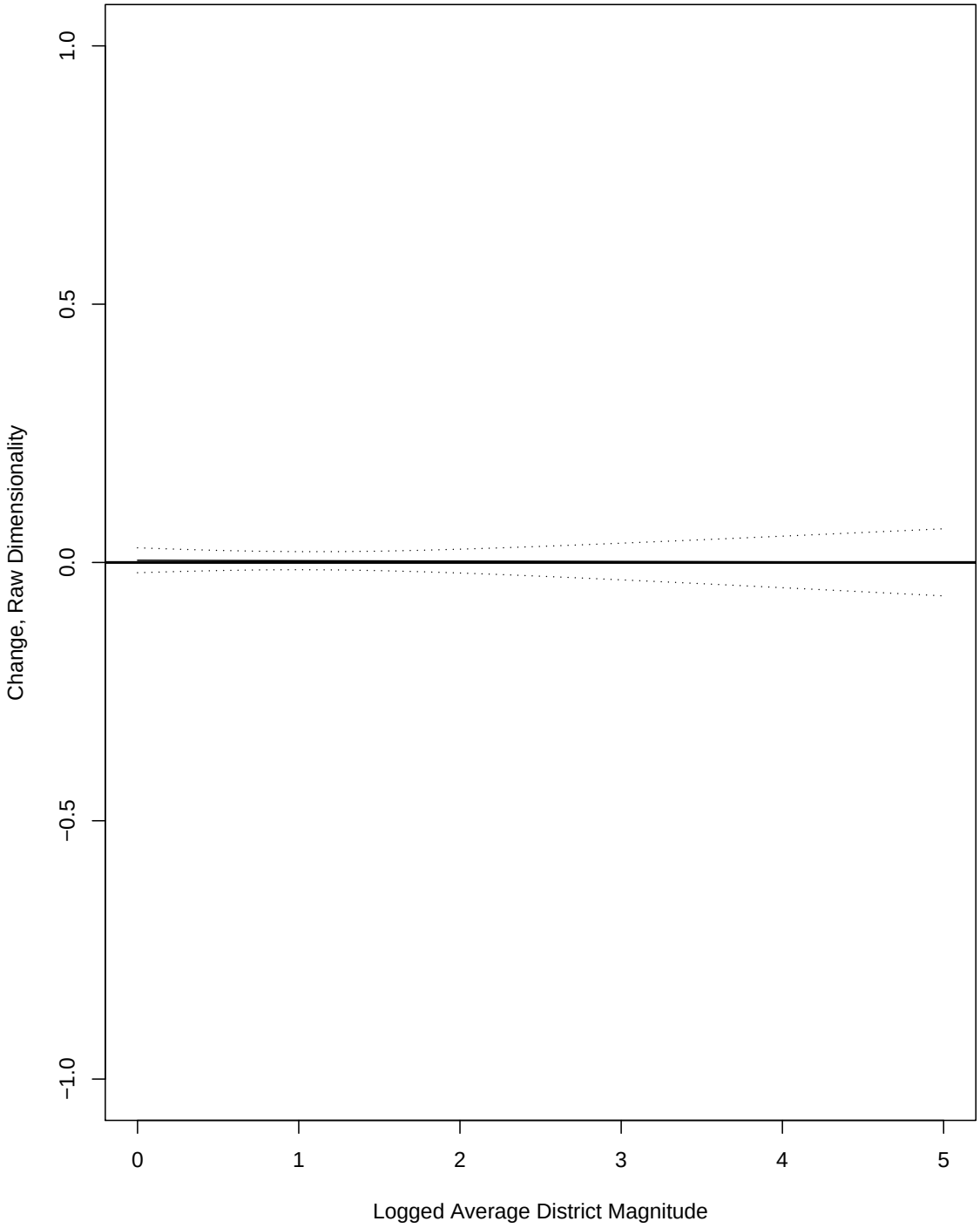

Figure 3: The estimated marginal effect of the number of new parties upon the raw ideological dimensionality for the observed range of the logged average district magnitude (Model 5).

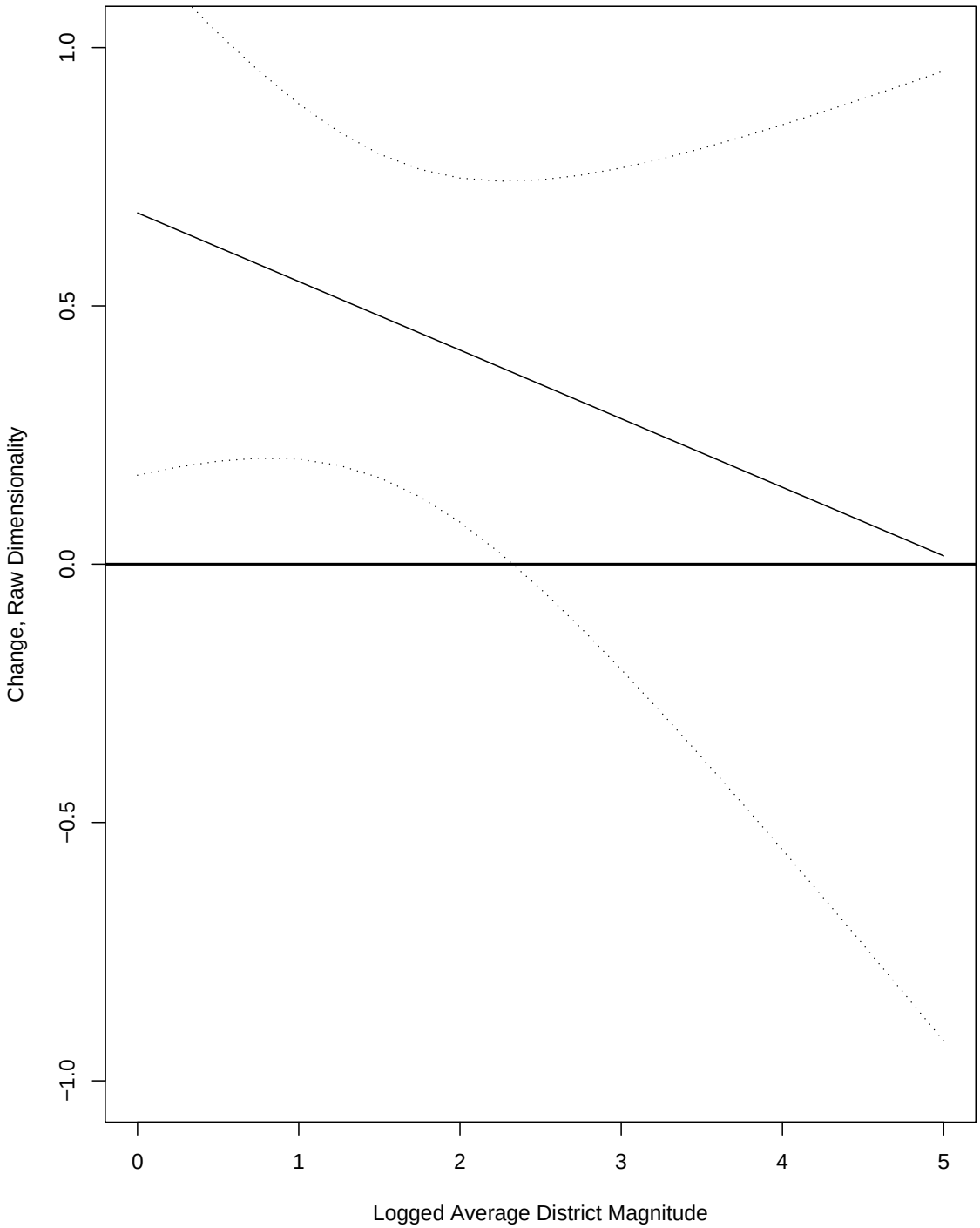

Figure 4: The estimated marginal effect of the number of new parties upon the raw issue dimensionality for the observed range of the logged average district magnitude (Model 6).

Model	1	2	3	4	5	6
Measure	Raw Ideology	Raw Issue	Raw Ideology	Raw Issue	Raw Ideology	Raw Issue
Intercept	2.1*** (0.23)	1.9*** (0.33)	2.2*** (0.60)	1.7*** (0.38)	1.1*** (0.15)	17*** (1.1)
Dimensionality	0.53*** (0.16)	0.048** (0.018)	0.70*** (0.22)	0.059*** (0.021)		
Majoritarian			0.50 (0.66)	1.5 (1.2)	0.34*** (0.10)	−2.4* (1.3)
Dimensionality × Majoritarian			−0.57** (0.27)	−0.073* (0.044)		
New Parties					−0.0012 (0.012)	0.047 (0.17)
New Parties × Majoritarian					−0.021 (0.017)	0.33 (0.25)
n	347	237	347	237	217	171
Root MSE	0.85	0.96	0.85	0.96	0.29	3.3
R^2	0.65	0.54	0.65	0.54	0.39	0.56

Table 18: The estimated OLS coefficients for Models 1–6 with country fixed effects. The dependent variable in Models 1–4 is the effective number of electoral parties and the dependent variable in Models 5 and 6 is the raw dimensionality; the independent variable in Models 1–4 is the raw dimensionality and the independent variable in Models 5 and 6 is the number of new parties. Newey-West robust standard errors appear in parentheses. The estimated fixed effects are not shown. Significance codes are for two-sided tests, all calculated prior to rounding to two significant digits: 0.01, ***; 0.05, **; 0.10, *.

Model	Permissive	Restrictive
3	0.70	0.12
	[0.27, 1.1]	[−0.18, 0.43]
4	0.059	−0.015
	[0.016, 0.10]	[−0.092, 0.062]
5	−0.0012	−0.022
	[−0.024, 0.022]	[−0.045, 0.0032]
6	0.047	0.38
	[−0.30, 0.39]	[0.039, 0.72]

Table 19: The estimated marginal effect of dimensionality for permissive (non-majoritarian) and restrictive (majoritarian) electoral systems using fixed effect versions of the interaction models (Models 3–6). For Models 3 and 4, this is the marginal effect of dimensionality on the effective number of electoral parties; for Models 5 and 6, it is the marginal effect of the number of new parties on the dimensionality. Ninety-five percent two-sided confidence intervals appear in brackets.

Model	5	6
Measure	Raw Ideology	Raw Issue
Intercept	0.19	−0.56
	(0.29)	(0.44)
Dimensionality	0.11	0.051**
	(0.17)	(0.024)
Majoritarian	0.45	−1.7
	(0.82)	(1.2)
Dimensionality × Majoritarian	−0.34	0.070*
	(0.45)	(0.040)
n	217	171

Table 20: The estimated coefficients for versions of Models 5 and 6 estimated using negative binomial regression. The dependent variable is the number of new parties and the independent variable the raw dimensionality. Newey-West robust standard errors appear in parentheses. Significance codes are for two-sided tests, all calculated prior to rounding to two significant digits: 0.01, ***; 0.05, **; 0.10, *.

Model	Permissive	Restrictive
5	0.11	−0.22
	[−0.22, 0.45]	[−1.0, 0.60]
	1.1	0.80
6	0.051	0.12
	[0.0030, 0.099]	[0.059, 0.18]
	1.1	1.1

Table 21: The estimated marginal effect of raw dimensionality on the number of new parties for permissive (non-majoritarian) and restrictive (majoritarian) electoral systems (Models 5 and 6). The third row for each model additionally reports the factor change in the number of new parties from an additional dimension.

Model	1	2	3	4	5	6
Measure	Raw Ideol ogy	Raw Issue	Raw Ideol ogy	Raw Is sue	Raw Ideol ogy	Raw Is sue
Intercept	2.9*** (0.80)	3.2*** (0.77)	2.6*** (0.53)	2.9*** (0.81)	1.5*** (0.073)	17*** (0.86)
Raw Dimensionality	0.65 (0.57)	0.049 (0.044)	1.2*** (0.30)	0.076 (0.046)		
Majoritarian			0.81 (0.83)	−2.3** (0.83)	−0.016 (0.089)	7.4*** (1.2)
Raw Dimensionality × Majoritarian			−1.4** (0.56)	0.050 (0.051)		
New Parties					0.0071 (0.010)	0.40** (0.17)
New Parties × Majoritarian					−0.013 (0.015)	−0.076 (0.18)
n	347	237	347	237	217	171
Root MSE	1.4	1.3	1.2	1.3	0.35	4.0
R^2	0.037	0.030	0.27	0.077	0.0031	0.28

Table 22: The estimated OLS coefficients for Models 1–6 with country-clustered robust standard errors instead of Newey-West robust standard errors in parentheses. The dependent variable in Models 1–4 is the effective number of electoral parties and the dependent variable in Models 5 and 6 is the raw dimensionality; the independent variable in Models 1–4 is the raw dimensionality and the independent variable in Models 5 and 6 is the number of new parties. Significance codes are for two-sided tests, all calculated prior to rounding to two significant digits: 0.01, ***; 0.05, **; 0.10, *.

Model	Permissive	Restrictive
3	1.2	−0.25
	[0.57, 1.7]	[−1.2, 0.69]
4	0.076	0.13
	[−0.014, 0.17]	[0.084, 0.17]
5	0.0071	−0.0059
	[−0.014, 0.028]	[−0.026, 0.014]
6	0.40	0.33
	[0.063, 0.74]	[0.17, 0.48]

Table 23: The estimated marginal effect of dimensionality for permissive (non-majoritarian) and restrictive (majoritarian) electoral systems using country clustered robust standard errors (Models 3–6). For Models 3 and 4, this is the marginal effect of dimensionality on the effective number of electoral parties; for Models 5 and 6, it is the marginal effect of the number of new parties on the dimensionality. Ninety-five percent two-sided confidence intervals appear in brackets.

Code	Description	Code	Description	Code	Description
Socioeconomics		**Cultural/Ethnic**		**Foreign Policy**	
PER401	Free enterprise	PER301	Decentralization	PER101	Foreign Special Relationships, Positive
PER402	Incentives	PER302	Centralization	PER102	Foreign Special Relationships, Negative
PER403	Market Regulation	PER601	National Way of Life, Positive	PER103	Anti-imperialism
PER404	Economic Planning	PER602	National Way of Life, Negative	PER104	Military, Positive
PER405	Corporatism	PER607	Multiculturalism, Positive	PER105	Military, Negative
PER406	Protectionism, Positive	PER608	Multiculturalism, Negative	PER106	Peace
PER407	Protectionism, Negative	PER705	Underprivileged Minorities	PER107	Internationalism, Positive
PER408	Economic Goals	PER706	Non-economic Demographic Groups	PER108	EC/EU, Positive
PER409	Keynesian Demand Mgmt.			PER109	Internationalism, Negative
PER410	Productivity	**Religious**		PER110	EC/EU, Negative
PER411	Technology & Infrastructure	PER603	Traditional Morality, Positive		
PER412	Controlled Economy	PER604	Traditional Morality, Negative	**Democratic–Authoritarian**	
PER413	Nationalization			PER201	Human Rights & Freedom
PER414	Economic Orthodoxy	**Post-materialist**		PER202	Democracy
PER415	Marxist Analysis	PER416	Anti-Growth		
PER503	Social Justice	PER501	Environment	**Urban–Rural**	
PER504	Welfare State Expansion			PER703	Agriculture & Farmers
PER505	Welfare State Limitation				
PER506	Education Expansion				
PER507	Education Limitation				
PER701	Labor Groups, Positive				
PER702	Labor Groups, Negative				
PER704	Middle Class & Professional Groups				

Table 24: Baseline CMP coding category–conflict associations for the seven potentially salient ideological conflicts. Note that the democratic–authoritarian conflict is coded as having zero salience for all countries except Greece, Portugal, and Spain.

Country	Foreign Policy	Culture/Ethnic	Post-materialism
Australia		+ PER502	
Austria	+ PER601 (< 1/1/80) + PER602 (< 1/1/80)	− PER601 − PER602	+ PER601 (> 1/1/80) + PER602 (> 1/1/80) + PER305
Belgium		+ PER605 (> 1/1/60) + PER502 + PER203 + PER204	
Canada		+ PER203 + PER204	
France	+ PER601 (< 1/1/82) + PER602 (< 1/1/82)	− PER601 (< 1/1/82) − PER602 (< 1/1/82) + PER605 (> 1/1/60) + PER502	
Germany	+ PER601 + PER602	− PER601 − PER602	
Greece	+ PER601 + PER602	− PER601 − PER602	+ PER502
Ireland	+ PER601 + PER602	− PER601 − PER602	
Israel	+ PER601 + PER602 + PER201 + PER305 + PER202	− PER601 − PER602	
Italy		+ PER502	
Japan	+ PER203 + PER204	− PER301 − PER302	
Luxembourg		+ PER605 (> 1/1/60) + PER502	
Netherlands		+ PER502 + PER605 (> 1/1/60)	
New Zealand		+ PER605 (> 1/1/60)	
Norway		+ PER502	
Portugal		+ PER502	
Spain		+ PER502 + PER605 (> 1/1/60)	
Switzerland		+ PER605 (> 1/1/60) + PER502	
United Kingdom		+ PER605 (> 1/1/60)	+ PER502
United States	+ PER601 + PER602	− PER601 − PER602 + PER502	

Table 25: Country and time-specific modifications to the baseline CMP coding category–conflict associations in Table 24.